XI. *Aſtronomical Obſervations made in the* Auſtrian Netherlands *in* 1772 *and* 1773. *By* Nathanael Pigott, *Eſquire, F. R. S. Foreign Member of the Academies of* Bruſſels *and* Caen. *In a Letter to the Reverend* Nevil Maſkelyne, *Aſtronomer Royal, F. R. S.*

TO THE REV. NEVIL MASKELYNE.

REV. SIR, Louvain, Auguſt 11, 1775.

R. Dec. 9, 1775. I RECEIVED, about a month ago, the favour of your letter, and return you many thanks for the Greenwich obſervations, which you were ſo obliging to ſend me. I wait, with impatience, the publication of your journey into Scotland, which muſt be very curious and intereſting. I beg of you, SIR, to preſent my reſpects to the Royal Society, with the incloſed aſtronomical obſervations, which I have contracted as much as I well could, conſiſtently with a view of affording means to verify them, or rectify any miſtake which, by inadvertency, may have crept in. I ſhall only add a ſhort account of the inſtruments I uſed, and the elements I employed in the calculations, that a proper judgement may be formed, how far theſe obſervations may be depended upon.

The meridian altitudes were taken with a quadrant one foot radius made by Mr. BIRD, very ſteadily fixed; free from any communication with the floor, and well placed in the plane of the meridian.

Repeated obſervations for the error of the line of collimation gave 1′ 58″,7 additive to the zenith diſtances.

I always obſerved both the limbs of the Sun on the meridian, when the weather would permit: its declination was computed from the Nautical Almanac: its parallax and all refractions, account being always kept of the height of the barometer and thermometer, from Profeſſor MAYER's tables, publiſhed by the Board of Longitude.

The declinations of the fixed ſtars were taken from the *Connoiſſance des tems*. The corrections on account of aberration and nutation, were either taken from the ſame ephemeris, or computed.

My ſon always obſerved ♃'s ſatellites with a reflector, made by SHORT, of eighteen inches focal length, magnifying 95 times. I obſerved them with a reflector of two feet and a half focal length, made by WING, magnifying the diameter of the object about 200 times.

The clock was a compound gridiron pendulum, made by the Sieur LE PAUTE at Paris.

The equal altitudes were taken with a quadrant of eighteen inches radius.

This aſtronomical journey was undertaken at the requeſt of the government here. They expreſſed a deſire that the ſituations of ſome of their towns, at leaſt, ſhould be determined by obſervation; and I readily concurred, without regretting either trouble or expence, in a project which had public utility in view.

I am, &c.

Cor-

Correſponding altitude of the Sun and Stars.

1772		h	′	″
Aug. 30.	Clock at noon corrected by four obſ. of Sun,	11	54	7,9
Sept. 5.	Clock at noon corrected by ſeven ditto,	11	47	26,8
13.	Clock at noon corrected by four ditto,	0	2	48,5
19.	Clock at noon corrected by ſeven ditto,	11	57	21,1
21.	Clock at noon corrected by ſeven ditto,	11	54	42,7
Oct. 10.	Clock at noon corrected by eight ditto,	11	32	37,7
11.	Clock at noon corrected by nine ditto,	11	31	20,9
19.	Clock at noon corrected by five ditto,	11	22	33,1
20.	Clock at noon corrected by five ditto,	11	21	31,0—
21.	Clock at noon corrected by ſix ditto,	11	20	30,5+
Nov. 9.	Clock at noon corrected by five ditto,	0	21	23,6—
11.	Clock at noon corrected by three ditto,	0	23	10+
13.	Clock at noon corrected by three ſets ditto,	0	24	55,1
14.	Clock at noon corrected by ſix ditto,	0	25	9,7+
20.	Clock at noon corrected by ſeven ditto,	0	30	30,5—
Ditto.	Fomahant croſſed the meridian by the clock,	7	28	28,0
21.	Fomahant croſſed the meridian by ditto,	7	25	19,9—
Dec. 23.	β Ceti on meridian by the clock,	6	39	38,5—
24.	Clock at noon corrected by four obſ. of Sun,	0	19	6,9

NAMUR 1772.

By a mean of eight meridian altitudes of the fixed ſtars taken in September, I determined the latitude of my obſervatory, in the *Rue St. Nicholas*, near the Recollets Church, 50° 28′ 32″ North.

Sept. 4, emerſion of ♃'s firſt ſat. at 10^h 38′ by the clock.

	Apparent times. h ′ ″
Emerſion at Tyrnaw in Hungary, by Father WEISS, 3½ feet achrom. weather fine,	11 41 11
To reduce to time of the Royal Obſervatory at Paris,	—1 0 55
Emerſion of the ſat. at Paris,	10 40 16
Emerſion by my ſon at Namur,	11 49 55
Namur Eaſt of the Paris Obſervatory, in time,	9 39

Or in parts of a great circle 2° 24′ 45″.

A very good obſervation. ♃'s belts very diſtinct. I ſaw the emerſion 5″ latter.

LUXEMBOURG 1772.

By a mean of twenty-nine meridian altitudes of the Sun and fixed ſtars taken in September and October, one of which only, gives the latitude 19,″9 different from the mean of the whole, I determined the latitude of my obſervatory, in the *Rue St. Eſprit*, near the Jeſuits Church, 49° 37′ 6″+ North,

Sept. 11. emerſion 4's firſt ſat. $12^h\ 55'\ 20''$ by the clock.

	Apparent times. h ′ ″
Emerſion at Greenwich, by the Nautical Almanac,	12 28 15
Error of tables, by a good obſervation at Tyrnaw, Sept. 4,	+0 7
Greenwich Weſt of Paris,	+9 16
Emerſion at Paris,	12 37 38
I obſerved it at Luxembourg,	12 53 19
Luxembourg Eaſt of Paris Obſervatory,	15 41

My ſon ſaw the emerſion 19″ later.

LUXEMBOURG, Sept. 20, 1772.

Emerſion 4's firſt ſat. at 9h 15′ 23″ by the clock.

	Apparent times. h ′ ″
Emerſion at Greenwich, by Nautical Almanac,	8 55 12
Error of tables, as above,	+ 7
Greenwich Weſt of Paris,	+ 9 16
Emerſion at Paris,	9 4 35
I obſerved it at Luxembourg,	9 19 52
Luxembourg Eaſt of Paris,	15 17

My ſon obſerved the emerſion 13″ later.

The ſame emerſion.

Emerſion at Greenwich, by Nautical Almanac,	8 55 12
Error of tables, by an obſervation at Greenwich on the 27th,	— 25
At Greenwich, by the tables corrected,	8 54 47
Difference of meridians,	+ 9 16
Emerſion at Paris,	9 4 3
I obſerved it at Luxembourgh,	9 19 52
Luxembourg Eaſt of Paris,	15 49

LUXEMBOURG, Oct. 19, 1772.

Emerſion 4's ſecond ſat. at 7h 31′ 39″ by the clock.

	Apparent time. h ′ ″
Emerſion at Tyrnaw, achrom. 3½ feet,	8 54 47
To reduce to Paris time,	—1 0 55
At Paris,	7 53 52
My ſon obſerved it at Luxembourg,	8 9 14
Luxembourg Eaſt of Paris,	15 22

I ſaw it 3″ later.

The ſame emerſion.

At Senones, by M. MESSIER, achrom. 5 feet,	8 12 8
To reduce to Paris time, according to his letter,	— 18 34
Emerſion at Paris,	7 53 34
At Luxembourg,	8 9 14
Luxembourg Eaſt of Paris,	15 40

This emerſion was obſerved alſo at 7h 44′ 13″ apparent time, with a 6 feet reflector, at Greenwich. Allowing, according to the Aſtronomer Royal's rule, about 20″ for the difference of teleſcopes, the reſult will be, Luxembourg Eaſt of Paris 15′ 25″.

LUXEMBOURG, Oct. 20, 1772.

Emerſion 4's firſt ſat. at 11h 0′ 15″ by the clock.

	Apparent time. h ′ ″
Emerſion at Greenwich, achrom. 3½ feet,	11 14 18
To reduce to Paris time,	+ 9 16
At Paris,	11 23 34
I obſerved it at Luxembourg,	11 39 13
Luxembourg Eaſt of Paris,	15 39

My ſon ſaw it 12″ later.

LUXEMBOURG, Oct. 11, 1772.

Eclipſe of the Moon.

By clock	Appar. time.			Luxemb. Eaſt of Paris.	
h ′ ″	h ′ ″			′ ″	
6 25 18	6 54 17	Galileus out of the ſhadow at Luxembourg,			
6 36 5	7 5 4	Copernicus begins to emerge at Luxembourg,			
6 38 0	7 6 59	Copernicus out at Luxembourg,			
	6 51 37	at Senones, reduced to Paris,		15	22
	6 51 54	at the Obſervatory at Paris,		15	5
6 40 42	7 9 41	Tycho begins to emerge at Luxembourg,			
6 42 35	7 11 34	Tycho out at Luxembourg,			
	6 56 13	at Senones, reduced to Paris,		15	21
	6 55 56	at the Obſervatory at Paris,		15	38
	6 56 21	Rue St. Honoré at Paris, by M. DE LA LANDE,		15	13
6 53 56	7 22 54	Manilius begins to emerge at Luxembourg,			
	7 7 25	at the Obſervatory at Paris,		15	29
	7 7 28	Paris, Rue St. Honore,		15	26
7 3 25	7 32 25	Mare Serenitatis out at Luxembourg,			
	7 17 10	Senones, reduced to Paris,		15	15
	7 17 23	at the Obſervatory at Paris,		15	2
7 12 17	7 41 17	Mare Criſium begins to emerge at Luxembourg,			
	7 26 18	at Paris, Rue St. Honoré,		14	59
7 17 37	7 46 35	Mare Criſium out at Luxembourg,			
	7 30 45	at Senones, reduced to Paris,		15	50
			By a mean,	15	20+
	7 52 7	end of the eclipſe at Luxembourg.			
	7 33 55	at Senones, by M. MESSIER, reduced to Paris.			
	7 35 46	at the Royal Obſervatory at Paris.			
	7 34 54	Paris, Rue St. Honoré, by M. DE LA LANDE.			

At Luxembourg, Sky remarkably clear, without the leaſt wind.

Hence, by a mean of 4's ſatellites,	15 33+
Luxembourg Eaſt of the R. Obſerv. at Paris, by a mean of the whole,	15 27+

Which gives 3° 51′ 45″ in parts of a great circle.

LUXEM-

LUXEMBOURG, 1772.

Oct. 22. at 3 hours P. M. a magnetic needle of four inches, made by DOLLOND, gave the declination Weſt 18° 42′½.

Oct. 23. at 10 hours A. M. the declination was 18° 50′.

At LA HEESE, near HOOGSTRAETEN.

By a mean of twenty-two meridian altitudes of the Sun and fixed ſtars taken in November 1772, one of which only, gives the latitude different from the mean of the whole 10″,2, I determined the latitude of my obſervatory 51° 23′ 2″+N.

Nov. 9. Emerſion 4's third ſat. 6h 49′ 29″ by the clock.

	Apparent time. h ′ ″
Emerſion at Tyrnaw, achrom. 3½ feet,	7 19 2
To reduce to Paris time,	−1 0 55
Emerſion at Paris,	6 18 7
I obſerved it at La Heeſe,	6 27 50
La Heeſe Eaſt of the Paris Obſervatory,	9 43

My ſon ſaw the Emerſion 13″ later.

LA HEESE, Nov. 14, 1772.

Emerſion 4's firſt ſat. at 6h 44′ 5″ by the clock.

	Apparent time. h ′ ″
Emerſion at Senones, achrom. 3½ feet,	6 27 7
To reduce to Paris time,	— 18 34
Emerſion at Paris,	6 8 33
I obſerved it at La Heeſe,	6 18 42
La Heeſe Eaſt of Paris,	10 9

The ſame emerſion.

At Greenwich, 6 feet reflector,	5 59 28
Difference of teleſcopes,	+ 0 15
Greenwich Weſt of Paris,	+ 9 16
Emerſion at Paris,	6 8 59
By my obſervation at La Heeſe,	6 18 42
La Heeſe Eaſt of Paris,	9 43

Nov. 20. Emerſion 4's ſecond ſat. at 8h 15′ 59″ by the clock.

Emerſion by my ſon, but I have no correſponding obſevation,	7 45 9

At

At LA HEESE, Nov. 21, 1772.

Emerſion 4's firſt ſat. at 8h 45′ 12″ by the clock.

	Apparent time. h ′ ″
Emerſion at Greenwich, by Nautical Almanac,	7 53 54
Error of tables, by the obſerv. at Greenwich, Senones, and Tyrnaw,	+ 12
Greenwich Weſt of Paris,	+ 9 16
Emerſion at Paris,	8 3 22
I obſerved it at La Heeſe,	8 13 3
La Heeſe Eaſt of Paris,	9 41

My ſon ſaw the emerſion 5″ later.

By a mean of the obſervations of 4's ſatellites, *La Heeſe* is Eaſt of the Royal Obſervatory at Paris 9′ 49″ in time, or 2° 27′ 15″. If the obſervation of Nov. 14, compared with that made at *Senones*, be rejected, the difference of meridians will be $7\frac{1}{2}''$ in time leſs.

At HOOGSTRAETEN, Nov. 24, 1772.

By a baſe of 3028 feet, twice very exactly meaſured and angles taken with a quadrant 18 inches radius, I determined the church of *Hoogſtraeten* 10380 feet North and 5873 feet Eaſt of the Obſervatory at *La Heeſe*.

	° ′ ″
Hence latitude of La Heeſe,	51 23 2+
Difference of latitudes,	+ 1 42
Latitude North of the church of Hoogſtraeten,	51 24 44

	h ′ ″
Longitude of La Heeſe, as above,	0 9 49
Difference of meridians,	+ 6
Hoogſtraeten Eaſt of the Royal Obſervatory at Paris, in time,	9 55

Or 2° 28′ 45″ in parts of a great circle.

At OSTENDE.

By a mean of 24 meridian altitudes of the Sun and ſtars taken in December, one of which only, gives the latitude $11{,}7''$ different from the mean of the whole, I determined the latitude of my obſervatory, in the *Rue de la Poſte* 51° 15′ 10″ North.

The *Connoiſſance des tems* gives the lat. 51° 13′ 55″; but I do not know in what part of the town, or by whom it was determined.

At

At OSTENDE, Dec. 23, 1772.

Emerſion 4's firſt ſat. at 4h 52′ 48″ by the clock.

	Apparent time. h ′ ″
Emerſion at Greenwich, by Nautical Almanac,	4 22 1
Error of tables, as Nov. 21,	+ 12
Greenwich Weſt of Paris,	+ 9 16
Emerſion at Paris,	4 31 29
I obſerved it at Oſtende,	4 34 2
Oſtende Eaſt of Paris Obſervatory, in time,	2 33

Or 38′ 15″ in parts of a great circle.

Twilight ſtrong; ſky very clear and ſerene; good obſervation.

Dec. 24, at 3 hours P. M. I found the declination of the magnetic needle Weſt 20° 35½′.

At TOURNAI, 1773.

By a mean of 14 meridian altitudes of the Sun and ſtars taken in January, one of which only gives the latitude 22″,8 different from the mean of the whole, I determined the latitude of my obſervatory in the *Rue des Jeſuites* 50° 36′ 57″+ North.

The weather would not permit to obſerve either 4's ſatellites, or an occultation of a ſtar by the Moon, for the longitude of Tournai.